Managing Teacher's Digital

by Lukman Hakim

Managing Teacher's Digital Literacy in Responding to the Challenges of 21st Century Skills

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Article Info	Abstract
	Digital technology has become an essential part of the implementation of education. Therefore, this research aimed to find out the need for a digital literacy framework for teachers in facing the challenges of 21st-century education. The participants were 30 class teachers and four principals that were taken from 4 schools at Mataram. Data were taken using observation, interviews, questionnaires, and documentation. This study uses a descriptive qualitative research approach. The study results indicate that teachers need to increase digital literacy in aspects of Information and Information literacy, communication and collaboration, digital content creation, digital security, and digital problem-solving. The implications of this research can be seen in understanding the concept of improving the quality of teacher digital literacy according to the needs of teachers and the situation of the school environment
	Abstrak
	Teknologi digital telah menjadi bagian yang sangat penting dalam penyelenggaraan pendidikan. Oleh karena itu, tujuan penelitian adalah untuk mengetahui kebutuhan kerangka literasi digital guru dalam menghadapi tantangan pendidikan abad-21. Partisipan adalah guru kelas dan kepala sekolah yang berjumlah 30 dari Madrasah Ibtidaiyah Negeri Karang Baru, Madrasah Ibtidaiyah Al-Ittihadul Islamiyah Ampenan, dan Sekolah Dasar Integrasi Terpadu Sekarbela. Data diambil menggunakan observasi, wawancara, kuesioner, dan dokumentasi. Penelitian ini menggunakan pendekatan penelitian kualitatif deskriptif. Hasil penelitian menunjukkan bahwa guru membutuhkan peningkatan literasi digital pada aspek literasi Informasi dan Informasi, komunikasi dan kolaborasi, pembuatan konten digital, keamanan digital, dan pemecahan masalah digital. Implikasi penelitian ini terlihat pada pemahaman konsep peningkatan kualitas literasi digital guru sesuai kebutuhan guru dan situasi lingkungan sekolah.

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INTRODUCTION

Globalization has demanded that every teacher carry out quality teaching and learning tasks. It is related to graduates who must be able to meet the needs of global demands. Various teaching and learning activities in schools currently use various technology applications. Moreover, the Covid-19 pandemic condition has forced face-to-face learning activities to be carried out online. Covid-19 has had a significant impact on the world of education, including the education system in Indonesia. Traditional and routine learning that emphasizes teacher-student interaction in the classroom and outside the classroom shifts to distance learning or blended learning (Abidah et al., 2020)

The observations made on Monday 17-20 June 2021 concluded that the various problems faced in learning and teaching today are related to teachers' challenges of mastering technological devices. From the results of interviews with teachers in grades 1 to 6, it is concluded that their digital literacy level is still low in utilizing technology applications. They still have difficulties in integrating various technology media for teaching and learning activities in the classroom. In addition, schools must also be able to work closely with teachers to assist the implementation of online learning by providing multimedia facilities. In terms of advantages, online learning is not limited by space and time, especially since the government's call for self-quarantine, physical distancing, and social distancing. But today's freedom cannot be interpreted as unlimited freedom in learning. Online distance learning is described as a challenging experience that lacks efficient communication channels and fails to meet needs. Typical course delivery methods are challenging and lack social interaction (Alshawabkeh et al., 2021). Students are digital natives nowadays. They acquire digital literacy independently and are adept at using various Information and Communication Technology (ICT) tools to enrich their daily recreational lives. Therefore, teachers must be able to have digital skills beyond students.

Currently, digital technology has become an inseparable part of the implementation of education in schools. Previous research has described the phenomenon of digital technology widely used to assist learning activities (Ting, 2015). At the same time, ICT is one of the provisions for teachers in facing the challenges of a 21st-century learning environment with new technologies (Tondeur et al., 2018; Ifinedo et al., 2020). ICT practice can be a reform agenda for digital pedagogy. The findings of this study inform teachers' ICT practices and requirements for ICT professional development (Prestridge, 2012).

The application of ICT in the educational process becomes an absolute necessity to deal with various advances due to globalization. Therefore, this research is oriented towards identifying ways to improve the digital literacy of elementary school teachers related to the digital framework. The concept that is highlighted in this research is the perception of teachers and students in the practice of ICT for teaching and learning.

Based on this explanation, the purpose of this research is to find out the need for a digital literacy framework for teachers in facing the challenges of 21st-century education. The results of this study are also expected to provide benefits for increasing the digital literacy competence of teachers as a form of professional educators. Schools can apply input from teachers about the concept or framework of digital literacy they want in school.

METHOD

The primary data sources in this study were elementary school teachers in grades 1 to 6 from 4 elementary schools at Ampenan, Mataram. The participants were 26 teachers (F=15 and M=11) and four principals (M=4) from 4 schools. Participants aged between 25-50 years. Secondary data sources in this study include school documents and photo documentation of activities in the implementation of education. The study was conducted from July 2020 until June 2021. Data collection techniques used in this study consisted of observation, questionnaires, and documentation. Observations were made to observe the learning process in the 2020-2021 school year. The results of the observations were recorded in the research notebook. Documents are used to analyze data on teaching materials used by teachers. Meanwhile, questionnaires were distributed to teachers and school principals to determine the use of their digital competencies. Some aspects that are asked in the questionnaire are;

Table 1. Questionnaire Aspects

Code	Aspect	Questions	Yes	No
1	Information and Information Literacy	1. Does the school have digital devices? 2. Does the school have an internet network? 3. Does the school have an online file storage tool? 4. Does the school have school software? 5. Does the school have a management team for file content?		
2	Communication and Collaboration	6. Can teachers use tools to communicate online? 7. Can teachers do collaborative projects such as making videos for teaching materials? 8. Do teachers understand the use of websites that can be used for online learning activities so that there is uniformity in each class?		
3	Digital Content Creation	9. Does the school have a YouTube channel? 10. Does the teacher have a special learning video model?		
4	Security	11. Does the school have digital data protection? 12. Does the school have security procedures in the use of technology?		
5	Troubleshooting	13. Can teachers solve conceptual problems through digital media or digital tools for learning activities? 14. Can teachers develop creative use of technology? 15. Do teachers have digital skills in facing educational challenges in the global era?		

This study uses a descriptive qualitative research approach. This method presents the nature of the relationship between the researcher and respondent directly. In this context, researchers as observers and interviewers are related to the development of community participation, so that the ability to interact, communicate, understand, and study the environment is very important to obtain original, accurate, objective, and correct data (Creswell, 2012). Data analysis was carried out in two stages, namely (1) data analysis in single or individual cases and (2) cross-case data analysis. Checking the validity of the data in this study was conducted to ensure the reliability or validity of the data obtained. Checking the validity of research data in this study using Lincoln and Guba's theory which consists of 4 steps as follows, 1) credibility, transferability, dependence, and confirmability.

FINDING AND DISCUSSION

Observation data was obtained by observing learning and teaching activities carried out by teachers from four schools during the 2020-2021 school year. The results of the observations were recorded in the researcher's notes and analyzed. The results of the analysis of observations of the learning process carried out in the 2020-2021 academic year show that the online learning activities of the four schools have not utilized various technological applications. The teachers formed a WhatsApp (WA) group to share all information related to learning. The material prepared is taken from student textbooks that the school has used. Meanwhile, the teacher explains the material through voice notes that are distributed to the WA group. Video calling activities are only carried out 4 times in one semester for subjects considered difficult by students. Teachers do not use learning videos made by them or websites that can be used for learning. Meanwhile, document analysis was taken from teaching materials used by teachers during teaching and learning activities. Overall, it shows that teachers do not have teaching materials designed using digital technology applications.

The results of the questionnaire data analysis show that teachers need various activities to improve their digital literacy so that current learning activities can achieve the 21st-century skills needed today. This, of course, can have an impact on the quality of graduates. Several aspects that have been designed in the questionnaire refer to the results of research from (Sánchez-Cruzado et al., 2021) related to the Five areas of teacher digital competence. While the results of distributing the questionnaires are presented in the graph below;

Aspect of Teachers' Digital Literacy Framework

- ■ Information and Information Literacy ■ Communication and Collaboration
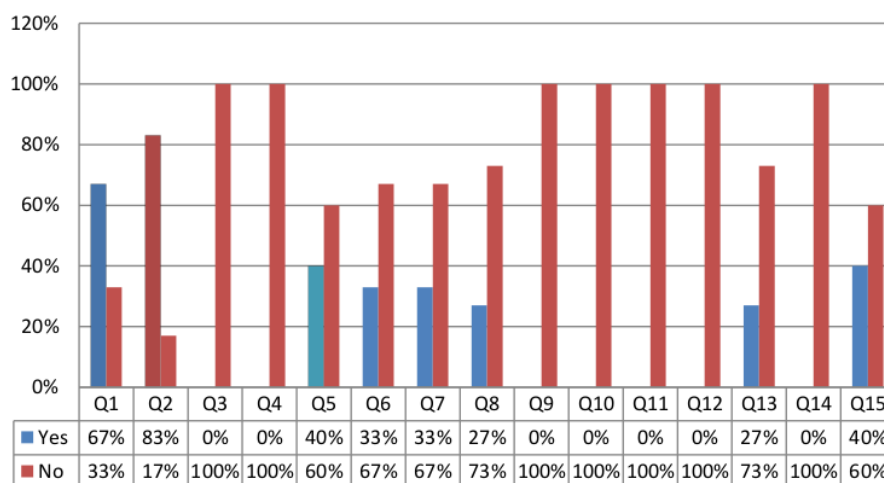- ■ Creation of Digital Content ■ Security
- ■ Problem Resolution

Graph 1. Recapitulation data teachers' digital literacy framework

Graph 1 shows that teachers agree with developing teacher digital literacy contained in various activities.

1. Information and Information Literacy: Schools must provide various digital devices, internet networks, online file store tools, school software, and file content management.
2. Communication and Collaboration: tools to communicate online, collaborative projects such as creating video teaching materials, and the determination from schools of websites that can be used for online learning activities so that there is uniformity in each class.
3. Digital Content Creation: schools have teacher-created learning video characters, schools have YouTube channels.
4. Security: For the protection of personal information and data, digital identity protection, digital content protection, security measures, and responsible and safe use of technology.
5. Problem Solving: To identify needs in the use of digital resources, make informed decisions about the most appropriate digital tools depending on the goals or needs, solve conceptual problems through digital media or digital tools, use technology creatively, solve technical problems, and improve skills or the competence of teachers as in the following activities;
   a) Providing training through webinars related to various applications that can be used for the delivery of teaching materials and learning interactions
   b) Providing workshops through webinars for making video materials so that students can learn comfortably and in an interesting way.
   c) Monitoring the teaching and learning activities of teachers regularly so that learning outcomes can achieve goals.
   d) Controlling activities are carried out by the principal on an ongoing basis.
   e) Providing facilities for the needs of the internet network in schools for teachers
   f) Teachers are allowed to visit student study groups if circumstances allow
   g) Teachers are asked to report student learning outcomes regularly to parents
   h) Teachers are required to attend various seminars (webinars) related to the use of technology devices for teaching and learning activities
   i) Teachers are asked to provide practice questions via mobile devices such as the *Gredu* application.

Recapitulation of Questionnaire Data

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Yes	67%	83%	0%	0%	40%	33%	33%	27%	0%	0%	0%	0%	27%	0%	40%
No	33%	17%	100%	100%	60%	67%	67%	73%	100%	100%	100%	100%	73%	100%	60%

Graph 2. Recapitulation of Questionnaire Data

*Q = Question

Graph 2 shows an understanding of the level of digital literacy of teachers in elementary schools. Overall, the four schools have digital equipment facilities and internet networks that are provided to assist online teaching and learning activities. However, these conditions are still limited. As such, the school does not have a track record of online storage and a dedicated team to address digital technology needs. This has an impact on the online communication skills of teachers from the use of this technology is still low because they have not thought about making learning videos that suit student needs. Moreover, the school does not have a special website or YouTube channel for online teaching and learning activities. So, it can be concluded that the level of digital literacy of teachers in facing the challenges of education in the 21st century still needs to be improved.

It was found several things related to increasing the digital literacy competence of teachers as a manifestation of the challenge in 21 century with the demands in Law Number 14 of 2015. Several school efforts have been made in managing teacher digital literacy during the pandemic Covid-19 using some training (Howard et al., 2021). The results of the interviews indicate that the school has made appropriate efforts to help teachers use various applications for learning activities related to digital technology. Teachers also get sufficient facilities for designing teaching materials in videos. So, the digital competence of the teachers at Karang Baru State Islamic Madrasah, Al-Ittihadul Islmiyah Islamic School Ampenan, and the Integrated Integrated Elementary School is quite good, although there are still some teachers who have difficulties. However, other teachers always help each other through regular meetings of principals and teachers via zoom. There is a need for greater theoretical elaboration in the field, and it provides several recommendations for investigating, understanding, and designing educational curricula and activities that support the development of digital media literacy (Manca, Bocconi, and Gleason 2021).

The interviews with 3 students related to learning activities through technology devices concluded that the teachers had delivered the material very well so far. The teacher creates a WA group as a means of communication. Videos that have been designed to be used are sent via WA groups so that students can easily watch them. Some teachers have uploaded videos of learning materials on YouTube, so students can watch them via YouTube. They are also happy with the practice activities or tests through the Gredu application, making it easier for students to work on questions.

Several studies have shown that students have positive attitudes towards using the internet as a learning tool (Goulão & Fombona, 2012). Today, ICT plays an important role in our society.

Education is not spared from this transformation because in a globalized world, when everything is changing, there is a need to continue education, recycle and expand it to provide answers to the challenges ahead. Computer literacy is an important competency in the 21st century. Students' digital competencies are important to their academic performance. Although experts have highlighted the importance of students' digital informal learning in developing their digital competencies, the mediating role of informal digital learning between digital competence and academic performance is still not explored (Mehrvarz et al., 2021) Currently, schools must be able to consider the existence of digital mastery experiences for teachers and students so that the implementation of education becomes a quality that can face global challenges. In conclusion, educators and curriculum designers should consider their digital competence and informal learning to improve students' academic performance.

The literature focuses on the competence of teacher educators in using technology to teach. Four competency domains were identified: technological competence, competence for the use of pedagogical and educational technology, beliefs about teaching and learning and competence in professional learning (Uerz et al., 2018). The professional digital competence of teachers is increasingly important in the classroom. Now digital resources and digital media are an important part of teachers' daily practice (Gudmundsdottir & Hatlevik, 2018). In addition, the demands of the digital era are forcing teacher educators to re-examine their professional identity in technology-integrated teaching. Institutional support is essential for the construction of professional identities (Avidov-Ungar & Forkosh-Baruch, 2018).

Digital transformation has implications for how and what to teach. Technology as a teaching tool and as a teaching content (Guggemos & Seufert, 2021). Teachers actively seek to resolve demanding situations by going beyond their current Professional Digital Competencies through engagement in various forms of digital transformative agency (Brevik et al., 2019). The interpretation of the concepts of digital competence and digital literacy has undergone long-term development, and its contemporary appearance is characterized by complexity and with a focus not only on technological skills but also the cognitive and attitudinal components of personality. Digital competency development, whether implemented in primary schools, in other forms of early education or even further education, is targeted at the respective educational impact entities and appropriate levels of digital literacy (Rambousek et al., 2016). Literacy practice mediated by digital technology involves interacting with resources in various modes of representation requiring multiple literacy skills. Therefore, professional educators are not only qualified in the scientific field, but mastery of technology is a very important part today as part of the scientific support possessed by teachers.

CONCLUSION

Data analysis concluded that the digital literacy competence of teachers currently has a considerable influence on the quality of teaching and learning (online classes) as well as the use of learning resources that involve the application of technology. The school has made various efforts to increase the level of digital literacy of teachers with various training activities or workshops. These various activities are carried out to support learning and teaching activities carried out online so that they are of higher quality. Teachers and students believe that the introduction of ICT in education is quite positive and requires a lot of basic knowledge of how to deal with the problems.

This research is still limited to identifying how schools can improve teacher digital literacy in facing the challenges of 21st-century education. Therefore, research results can still be developed in the aspect of teacher competency development according to the laws that have been set in Indonesia related to current technological developments. Moreover, the concept of online learning for each school is different because of the regional map and each person's ability. Limitations in this study could be related to improving the quality of education. In addition, this research also has implications for understanding the concept of improving the quality of teacher digital literacy by the needs of teachers and the situation of the school environment in providing education.

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